

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

In the Official Action, the Examiner rejects claims 1, 5, 8, and 10 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,247,384 to Inoue et al., (hereinafter "Inoue"). The Examiner also rejects claims 2-4, 6, 7, and 9 under 35 U.S.C. § 103(a) as being unpatentable over Inoue in view of U.S. Patent No. 4,088,982 to Haas (hereinafter "Haas"). In response, independent claims 1, 5, and 8 have been amended to clarify their distinguishing features.

The actuator drive apparatus and methods for driving the same of the present invention are directed to an electromagnetic actuator including a drive coil and a detection coil placed in close proximity. When a drive signal having a rectangular wave is applied to the drive coil from a control circuit in order to drive the actuator, mutual induction occurs in the detection coil in the form of a pulse synchronized only in timing with the leading edge and the trailing edge of the rectangular wave. The electromotive force of mutual induction is proportional to the rate of change of the driving current. Therefore, if the drive coil is driven with a rectangular wave, mutual induction occurs synchronized only in timing with the leading edge and the trailing edge of the rectangular wave, i.e., when there is a change in driving current. Moreover, at these times, mutual induction occurs in the form of a pulse having a high frequency component in comparison with the frequency of the driving current. If the drive coil is driven with a sinusoidal wave, the effect of the mutual induction continuously appears in the detection signal (output signal) of the detection coil.

A high frequency eliminating circuit/means is used to eliminate the mutual induction component, which is the pulse-form high frequency component. If only the mutual

induction component is removed from the output signal of the detection coil, the output signal of the detection coil, which is not affected by the mutual induction, can be obtained.

Independent claims 1, 5, and 8 have been amended to recite these distinguishing features. Specifically, claims 1 and 5 have been amended to recite that "said specific high frequency component is generated due to mutual induction of said drive coil and said detection coil and appears in said output signal of said detection coil in synchronism with a leading and trailing edge of the rectangular wave." Similarly, claim 8 has been amended to recite "said specific high frequency component being generated due to mutual induction of said drive coil and said detection coil and appearing in said output signal of said detection coil in synchronism with a leading and trailing edge of the rectangular wave." Furthermore, independent claims 1 and 5 have been further amended to clarify that the driving coil and detection coil are "provided on the movable section." The amendments to independent claims 1, 5, and 8 are fully supported in the original disclosure particularly, at lines 1-4, page 16 of the specification. Thus, no new matter has been entered into the disclosure by way of the present amendment to independent claims 1, 5, and 8.

The Examiner argues that Inoue discloses a control circuit (14) that applies a drive signal having a rectangular wave to the driving coil. However, in Inoue, a drive signal having a rectangular wave is applied from an external signal generator (42) when the resonance scanner (10) is not in a scanning mode. A drive signal from the external signal generator (42) is not applied when the scanner (10) is driven, i.e., when the scanner is scanning (see col. 9, line 18 to col. 10, line 19 of Inoue). Moreover, the Examiner argues that the reference discloses a high frequency elimination circuit (46) for eliminating a specific frequency component of the output signal of the detection coil. However, Inoue does not in

any way disclose or suggest eliminating the mutual induction component of the output signal of the detection coil as is now recited in independent claims 1, 5, and 8.

Hass discloses a low pass filter for eliminating high frequency noise. However, Haas also does not in any way disclose or suggest eliminating the mutual component of the output signal of the detection coil as is now recited in independent claims 1, 5, and 8.

With regard to the rejection of claims 1, 5, 8, and 10 under 35 U.S.C. § 102(b), an actuator drive apparatus and method having the features described above and as claimed in amended independent claims 1, 5, and 8, is nowhere disclosed in Inoue. Since it has been decided that "anticipation requires the presence in a single prior art reference, disclosure of each and every element of the claimed invention, arranged as in the claim,"¹ independent claims 1, 5, and 8 are not anticipated by Inoue. Accordingly, independent claims 1, 5, and 8 patentably distinguish over Inoue and are allowable. Claim 10 being dependent upon claim 8, is thus allowable therewith. Consequently, the Examiner is respectfully requested to withdraw the rejection of claims 1, 5, 8, and 10 under 35 U.S.C. § 102(b).

With regard to the rejection of claims 2-4, 6, 7, and 9 under 35 U.S.C. § 103(a), since independent claims 1, 5, and 8 patentably distinguish over the prior art and are allowable, claims 2-4, 6, 7, and 9 are allowable therewith because they depend from an allowable base claim.

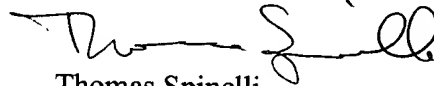
In other words, independent claims 1, 5, and 8, as amended, are not rendered obvious by the cited references because neither the Inoue patent nor the Haas patent, whether taken alone or in combination, teach or suggest an actuator drive apparatus and method

¹ Lindeman Maschinenfabrik GMBH v. American Hoist and Derrick Company, 730 F.2d 1452, 1458; 221 U.S.P.Q. 481, 485 (Fed. Cir., 1984).

having the features described above. Accordingly, claims 1, 5, and 8, as amended, patentably distinguish over the prior art and are allowable. Claims 2-4, 6, 7, and 9, being dependent upon claims 1, 5, and 8, are thus allowable therewith. Consequently, the Examiner is respectfully requested to withdraw the rejection of claims 2-4, 6, 7, and 9 under 35 U.S.C. § 103(a).

In view of the above, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,



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